

# Environment risk assessment and issues with hydrocarbon and geotoxicological factors

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**Abstract**— Our scientists recognize a disaster ecosystem as a result of changes in The geochemical composition of the Earth's biosphere. The paper aims to figure out What are issues of hydrocarbon and **Geotoxicology** and environment risk. By using descriptive method for primary model, synthesis methods and process analysis and analysis of difficulties and discussion, The study of this problem to some extent facilitates the extensive, although scattered and extremely heterogeneous analytical material in terms of the content of impurity elements in crude oil, refined products and gases accumulated over the years of exploration, production and disposal of hydrocarbons.

**Keywords**— hydrocarbon, analysis, risk, environment, geotoxicological factors.

## I. INTRODUCTION

Nowadays, one must understand that fuel and energy supply is a vital the need of today's industrial and post-industrial society, therefore unjustified restrictions in the development and consumption of hydrocarbon raw materials are impossible.

### Research questions:

Question 1: What are related studies on hydrocarbon and **Geotoxicology**?

Question 2: What are issues of hydrocarbon and **Geotoxicology** and environment risk?

Next, Dmitrieva and Romasheva (2020) pointed that Currently, the Russian oil and gas industry is characterized by significant reserves depletion and the late stage of development of most fields. At the same time, new fields that are brought into industrial development, in the majority of cases, have hard-to-recover reserves. Furthermore, most prospective oil and gas deposits are located in the Arctic and its offshore territories and their development is much more complicated due to regional peculiarities. This substantiates the necessity of a special approach to the development of the oil and gas potential of the Arctic, based on innovation. The goal of the paper is to reveal the role of innovation activity in the sustainable development of the oil and gas potential in the Arctic and its offshore zone. The paper briefly presents the main urgent factors of Arctic development, which highlight the necessity of innovation for its sustainability. Then, it introduces the methods used for the research: the Innovation Policy Road mapping

(IPRM) method in accordance with Sustainable Development Goals (SDGs) concept for clarifying how innovations will lead to sustainable development. In terms of results, this paper presents an innovation policy roadmap for the sustainable development of oil and gas resources of the Russian Arctic and its shelf zone and identifies the role of innovation within this development.

Then, Tynkynen (2019) bring together the features of the Russian hydrocarbon culture and the practices of Putin's fossil-inspired geo-governmentality in the context of a changing global climate. Putin's Russia continues the centuries-old practices of an empire that is violent towards its own people and the outside world and is simultaneously unable to utilize the bountiful resources that Russia possesses, which can be part of the solution of a healthy planet. This vision stems not only from the same geographical realities as the criticized geo-governmentality of the Putinite hydrocarbon culture, but also from a knowledge of the Russian national identity and culture. The task of unleashing the spatial and societal processes that will turn Russia into an internally strong and internationally respected player is difficult, but certainly not impossible. This requires a rethinking of the objectives and rules of the game in both domestic and cross-border contexts: how will Russians foster the necessary change from within, and how can Russia's partners enhance this through their efforts in the spheres of business and politics?

## II. METHODOLOGY

Authors have used qualitative and analytical methods, descriptive method for primary model, synthesis and discussion methods in this paper.

We also used historical materialism method.

## III. MAIN FINDINGS

### The key problem :

In 1980, in the city of Dzerzhinsk (Volga region), mass poisonings were registered among TPP workers, similar to poisoning with arsenic compounds. Conducted research

showed that the cause of poisoning is the hurricane content of vanadium in fuel oils obtained from oil from one of the fields in the Volga region. Toxic lesions in Komi and Dzerzhinsk

identified exclusively at the medical level on the basis of mass specific diseases.

In those cases where the toxic impurity does not cause such an impressive effect or medical statistics archaic

impact is usually hidden. Hidden Defeat continues indefinitely, expressed in an increased, outwardly unmotivated morbidity in people. For example, in the province of Ontario (Canada) in a number of regions increased incidence of Alzheimer's disease. Reason after analysis turned out to be unexpected - in tap water, the aluminum content exceeded the MPC by 10 times.

Aluminum compounds, aluminum chloride, aluminum hydroxochloride and other widely are used as part of coagulants in secondary oil recovery methods, for example, reservoir flooding.

Sometimes the connection of human diseases with the development of hydrocarbon raw materials is so veiled that the identification of this relationship requires special biomedical research. Yes, after discovery and start of development of the Astrakhan gas condensate field containing composition of gases by 25% CO<sub>2</sub>, and H<sub>2</sub>S, a new type of heavy, often lethal diseases called Astrakhan fever. For the first time Astrakhan fever was registered in 1983.



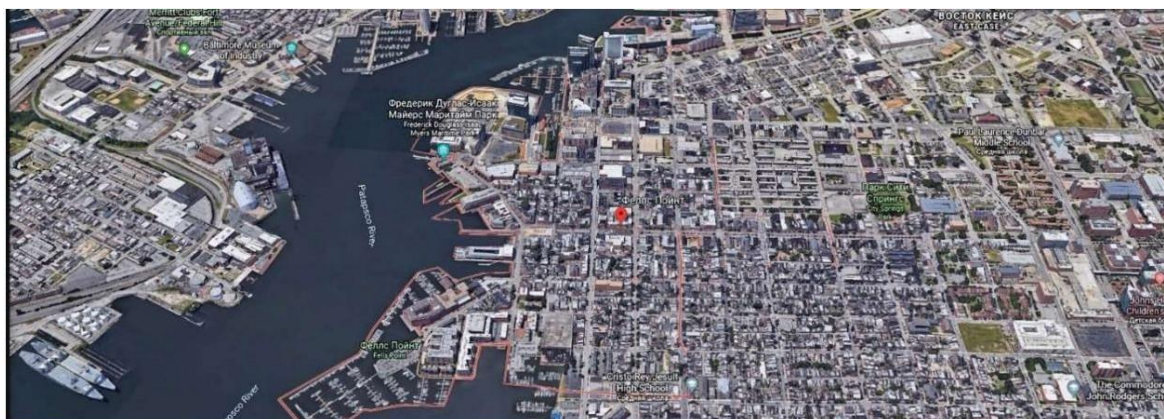




*Fig.1 - Astrakhan gas chemical plant. (Photo by Anatoly Kalachev map service Google Maps)*

It was believed that it was connected with the construction of a gas chemical complex and pollution environment. However, later Academician I.V. Tarasevich together with the French scientists found that the causative agent of Astrakhan fever is a new species microorganisms

close to the causative agent of Mediterranean spotted fever, and carrier - dog ticks. Astrakhan Gas Condensate Plant emits atmosphere with large amounts of carbon dioxide. Gas concentration in the surface layer attracts ticks, and ticks find their hosts, including among people.



*Fig.2 - Fell's Point, Baltimore, USA. Area of the former Baltimore Chrome Works. (mapping service Google Maps)*

An example with similar consequences is Baltimore (USA). medical statistics identified a territory on the port outskirts of the city, where the death rate of citizens from lung cancer was 4.3 times higher than in the city. Incidence of lung cancer in former workers factories are 14 times higher than the average for the city. It turned out that this was the territory of the former chrome ore processing plant Baltimore Chrome Works, which produced compounds chromium and arsenic. The plant worked for 172 years, from 1813 to 1985, and was closed on demand US Environmental Protection Agency (EPA). A 20-acre (81,000 m<sup>2</sup>) site was subjected to toxic damage. From 1986 to 1999, thirteen years old, receiver company

Baltimore Chrome Works - Allied Chemical, court-ordered cleaning area to an acceptable level. The cost of cleaning up the Baltimore plant site amounted to 110 million US dollars.

Arsenic is an active carcinogen regularly observed in fuel raw materials - oil, gases and coals. There is no need to continue listing such examples. Together with industrial development of regions is also deteriorating the ecological situation, most of all in the areas of processing raw materials. Hydrocarbons play an important role in this kind of environmental pollution. both natural and processed products. Despite the lack of knowledge of this problem, there obvious positions. For example, according to the degree of prevalence and secrecy of the impact the most

dangerous, especially when consumed, are processed products (fuel oil) of heavy sour oil enriched in metal complexes, massively produced in the European part RF. The share of heavy oil production in the Russian Federation does not exceed 23% (2016), however, within the densely populated Volga region is at least 40% (2010) and the volume of production is constantly growing.

#### IV. DISCUSSION AND CONCLUSION

The study of this problem to some extent facilitates the extensive, although scattered and extremely heterogeneous analytical material in terms of the content of impurity elements in crude oil, refined products and gases accumulated over the years of exploration, production and disposal of hydrocarbons.

At present, the active development of mankind deposited in mineral resources, including the organic matter of toxicants, leads to the manifestation of negative biological activity of the dispersion products of toxoelements in the environment. changing geochemical appearance of entire regions of the planet.

At the same time, a dilemma arises - which development scenario will we consciously choose.

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